

## Just the Facts...

### Boutonneuse Fever

#### Q. What is Boutonneuse fever?

A. Boutonneuse fever is one of a group of several tick-borne spotted fever illnesses, including Rocky Mountain spotted fever, that are caused by closely-related rickettsiae (tiny bacteria in the genus *Rickettsia*). *Rickettsia conorii* is the agent of Boutonneuse fever. The name for Boutonneuse fever arises from the black “button-like” (French “bouton”) ulcer that occurs at the site of the tick bite. Boutonneuse fever sometimes goes by other names, often based upon the geographic location of occurrence, including Mediterranean spotted fever (most commonly), Mediterranean tick fever, Marseilles fever, Kenya tick typhus, South African tick typhus, India tick typhus, and Israeli tick typhus.

#### Q. How is Boutonneuse fever transmitted?

A. Boutonneuse fever is transmitted by the bite of a brown dog tick (*Rhipicephalus sanguineus*) that is infected with the pathogen *R. conorii*. *Rhipicephalus sanguineus* ticks maintain *R. conorii* in nature through transovarial passage (female tick to her eggs) and transstadial passage (from stage to stage during the tick’s life cycle). Since *R. sanguineus* ticks are found (feed) mainly on dogs, people who have close contact with dogs are at a higher risk of exposure to potentially infected ticks. Rarely, infection may occur when crushed tissues or feces of the tick enter the body through breaks in the skin or the mucous membranes.

#### Q. How common is Boutonneuse fever?

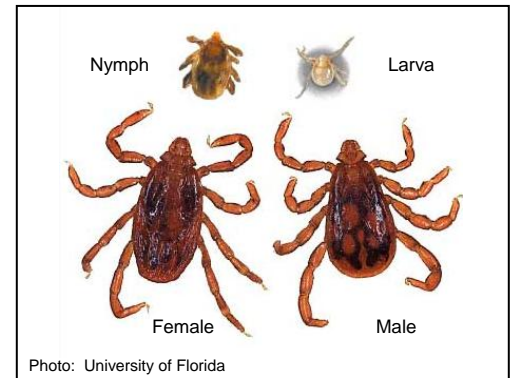
A. Boutonneuse fever is found in those parts of Europe and the Middle East that are adjacent to the Mediterranean, Black, and Caspian Seas. It also occurs throughout India as well as other locations within Africa. The true incidence is unknown. Because infection is often very mild, cases may go undiagnosed, may be misdiagnosed, or may simply not be reported. In the Mediterranean region, the incidence is estimated at 50 cases per 100,000 per year. In Croatia, 52% of a study population with a recent history of tick bite had antibodies to *R. conorii*. In Portugal, as many as 20,000 cases are estimated to occur each year, but only about 5% are reported.\*\*

#### Q. What are the symptoms of Boutonneuse fever?

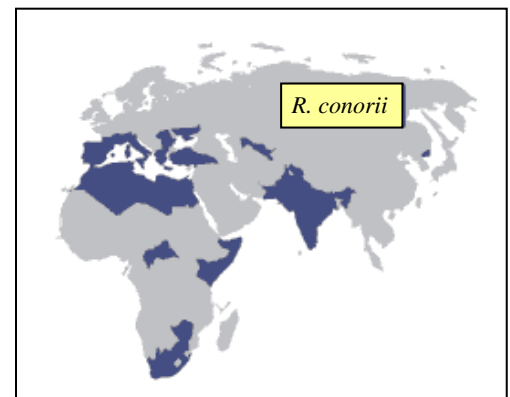
A. Symptoms of Boutonneuse fever begin abruptly 5-7 days after an infective tick bite, and often include high fever, severe headache, a tache noir (small black ulcer or scab, approximately 2-5 mm in diameter, at the site of the tick bite), and a widespread red maculopapular rash (both flat and raised spots) that is especially prominent on the legs, feet (soles) and hands (palms). Symptoms may also include myalgia (muscle aches), arthralgia (joint pain), chills, malaise (generalized, overall feeling of discomfort – feeling “unwell”), nausea, vomiting, and conjunctivitis. Severe complications can occur, especially in the elderly, or in those patients who have underlying disease or who are immunocompromised. The case-fatality rate for Boutonneuse fever is less than 3% even without specific treatment.

#### Q. How is Boutonneuse fever diagnosed?

A. Boutonneuse fever should be suspected in a patient who has fever, rash, and a tache noir, especially when there is a history of tick bite and/or travel to an endemic area (location where the disease is known to exist). Recent contact with a dog may also raise suspicion. Prompt differential diagnosis is critical, ensuring immediate treatment is initiated in the event the symptoms are due to another, more severe, illness (e.g. Rocky Mountain spotted fever). Laboratory confirmation is made by blood tests, PCR or immunostains of biopsied tissues, or culture.



Life stages of *Rhipicephalus sanguineus* (brown dog tick), the vector for *Rickettsia conorii*.



Distribution of *Rickettsia conorii*, the agent of Boutonneuse fever.\*



Rash (left and right) and tache noir (right center) associated with Boutonneuse fever.

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\* Parola, P., H. Inokuma, J.L. Camicas, P. Brouqui, & D. Raoult. Detection and Identification of Spotted Fever Group Rickettsiae and Ehrlichiae in African Ticks. EID 2001; 7(6): 1014-1017.




\*\* Zalewska, A. & R Schwartz. Boutonneuse Fever. eMedicine online, updated January 2007.


**Q. How is Boutonneuse fever treated?**

**A.** Antibiotic therapy is important to shorten the course of illness, prevent complications, and eradicate the infection. Doxycycline is the drug of choice, although chloramphenicol and quinolones are also effective. Macrolides such as azithromycin and clarithromycin have been shown to be efficacious in children, or as alternatives to doxycycline in adults. Patients typically improve within 24 hours after initiation of treatment, and a delay in response should cast doubt upon the diagnosis. Since rickettsial diseases can be so severe in some cases, treatment should be initiated immediately upon suspicion without waiting for laboratory confirmation of the diagnosis.


**Q. How can I protect myself against Boutonneuse fever?**

**A.** There is no vaccine against Boutonneuse fever. Therefore, in order to prevent this illness, as well as other tick-borne diseases, you must protect yourself from tick bites. When in tick habitat (tall grass and weeds, scrubby areas, woods and leaf litter), follow these precautions:

-  Wear proper clothing as a physical barrier against ticks – long pants tucked into boots or tightly-woven socks; long sleeve shirt; shirt tucked into pants; and light-colored clothing so as to more easily spot ticks.
-  Check your skin and clothing periodically for ticks.
-  Use both skin and clothing repellents that have been approved by the Environmental Protection Agency (EPA). They are safe and effective. Always FOLLOW LABEL DIRECTIONS.
  - For your skin, use a product that contains 20-50% **DEET** (N, N-diethyl-meta-toluamide). **DEET** in higher concentrations is no more effective.
  - Use **DEET** sparingly on children, and don't apply to their hands, which they often place in their eyes and mouths.
  - Apply **DEET** lightly and evenly to exposed skin; do not use underneath clothing. Avoid contact with eyes, lips, and broken or irritated skin.
  - To apply to your face, first dispense a small amount of **DEET** onto your hands and then carefully spread a thin layer.
  - Wash **DEET** off when your exposure to mosquitoes, and other arthropods, ceases.
  - When using **DEET** and a sunscreen, apply the sunscreen first. After 30 minutes to an hour, apply the **DEET**. This allows the sunscreen time to penetrate and bind to the skin, and will not interfere with the efficacy of the **DEET**.
  - For your clothing, use a product that contains **permethrin**. **Permethrin** is available commercially as 0.5% spray formulations. Clothing that is factory-impregnated with permethrin may also be purchased commercially. Permethrin will withstand numerous launderings.

 For optimum protection, soldiers should utilize the **DOD INSECT REPELLENT SYSTEM**. In addition to proper wear of the military field uniform (pants tucked into boots, sleeves down, undershirt tucked into pants), this system includes the concurrent use of both skin and clothing repellents:

- Standard military skin repellent: 33% **DEET** lotion, long-acting formulation, one application lasts up to 12 hours or more, **NSN 6840-01-284-3982**.
- Standard military clothing repellents: either IDA (impregnation kit), 40% **permethrin**, one application lasts the life of the uniform (approx. 50 washes), **NSN 6840-01-345-0237**; or aerosol spray, 0.5% **permethrin**, one application lasts through 5-6 washes, **NSN 6840-01-278-1336**. Factory permethrin-treated uniforms are also available via contract [Contact the Armed Forces Pest Management Board (AFPMB) for details, DSN 295-7476; CM (301) 295-7476].

 Groom pets well to prevent ticks from being carried into the home.

**Q. What should I do if I find a tick attached to my skin?**

**A.** Remove an attached tick as soon as it is found to help prevent transmission of pathogens. Use fine-pointed tweezers to firmly grasp the tick's mouthparts up against the skin, and pull back firmly and steadily. Be patient – the tick's central mouthpart called the hypostome is covered with sharp barbs, sometimes making removal difficult. Never squeeze the body of the tick or use such things as petroleum jelly, fingernail polish remover, or a lighted match: these methods could force more infective fluid into the skin. After removal, wash the wound site, and apply an antiseptic. Preserve the tick by placing it in a clean, dry jar, or other well-sealed container, and keeping it in your freezer. Should you develop disease symptoms, take the tick with you to the physician's office; identification of the tick species may assist the physician with your diagnosis and treatment. You may discard the tick after one month; all known tick-borne diseases will generally display symptoms within this time period.

